

# ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY

## EXECUTIVE SUMMARY

- **Federal Agency Name(s):** National Geodetic Survey (NGS), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce
- **Funding Opportunity Title:** Geodetic Science and Applied Research (GSAR) Program
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** GSAR 2004
- **Catalog of Federal Domestic Assistance (CFDA) Number(s):** 11,400, Applied Geodetic Research
- **Dates:** Proposals must be received by the NGS no later than 5 p.m., EDT, November 17, 2003.
- **Funding Opportunity Description:** The GSAR Program represents an NOAA/NGS effort to conduct basic and applied research in the geodetic sciences that advances positioning operations and services in support of transportation and commerce on a national basis. This initial opportunity is focused on a specific problem: Three-Frequency Real-Time Kinematic (RTK) Positioning by Different Support Architectures. There are at least 8 additional sign priorities that will be addressed in the future in the GSAR Program.

## **FULL ANNOUNCEMENT TEXT**

### **I. Funding Opportunity Description**

#### **A. Program Objective**

The long term objective of the GSAR Program is to improve positioning operations and services in support of transportation and commerce on a national basis by addressing the following science priorities : Methods and approaches to Real-Time Kinematic (RTK) carrier phase positioning over long distances, including On-The-Fly (OTF) capability, Kalman filtering, and single-epoch methods; GPS carrier phase ambiguity resolution, including performance under bias; Computation and utilization of ionosphere models and impacts on RTK positioning; Computation and utilization of troposphere models and impacts on RTK positioning; Multipath suppression, including antenna design, receiver hardware design, and software receiver algorithms; GPS satellite calibration, including satellite interchannel bias, antenna phase center locations, and antenna phase center variation; Methods for GPS receiver antenna calibration, including receiver interchannel bias, antenna phase center locations and antenna phase center variation; Models and approaches for precision GPS orbit and satellite clock solutions; Design of national augmentation infrastructures supporting centimeter-level positioning.

Other national priorities which will be considered are: Global, regional, and national reference frame maintenance; High-resolution national geoid modeling; Efficient orthometric height determination; Datum transformations and relationships, including tidal datums; Crustal motion models, including subsidence effects; Fusion of geometric data (photogrammetry, LIDAR, interferometric synthetic aperture radar (IFSAR) with radiometric data (imaging spectrometers); Enhanced methodologies to support shoreline mapping of the Alaska coastline.

#### **B. Program Priorities**

NOAA will give sole attention to individual proposals addressing the identified science priority listed below. Future opportunities may cover related topics or may address broader topics.

The names, affiliations, and phone numbers of relevant NGS focal points are provided. Prospective applicants should communicate with these focal points for information on priorities within a specific study topic. Focal points cannot assist in the conceptual design and specific elements to be included in a proposal. Applicants should send completed proposals to the NOAA/NGS

program office identified in Section IV.F., rather than to individual focal points.

#### **1. Three-Frequency Real-Time Kinematic (RTK) Positioning by Different Support Architectures**

Perform theoretical analysis of support infrastructure necessary for instantaneous, centimeter-level, long range positioning by means of the Global Positioning System (GPS) L1, L2, and L5 carrier phase signals. Investigate real-time ambiguity resolution methods in both long range (e.g. 200 km) difference mode and in precise absolute positioning mode. Study use of ionospheric grid models to enhance three-frequency ambiguity resolution success rates.

FOR FURTHER INFORMATION CONTACT: Dennis Milbert, NOAA/NOS/Office of National Geodetic Survey, 301-713-3222 ext. 144, or at [Dennis.Milbert@noaa.gov](mailto:Dennis.Milbert@noaa.gov).

#### **C. Program Authority:**

Authority for the GSAR program is provided by the following: 33 U.S.C. 883d.

## **II. Award Information**

### **A. Funding Availability**

This funding opportunity announces that \$65,000 will be available through this announcement for fiscal year 2004. Proposals should be prepared assuming an annual budget of no more than \$65,000. It is expected that one award will be made, depending on availability of funds.

### **B. Project/Award Period**

This program announcement is for projects to be conducted by university investigators for a 1-year period, with an anticipated start date of November 1, 2003. If an application is selected for funding, the NGS has no obligation to provide additional funding in connection with that award in subsequent years. Applications must include a scope of work and a budget for the award period.

## **III. Eligibility Information**

### **A. Eligible Applicants**

Eligible applicants are institutions of higher education and federally funded educational institutions such as the Naval Postgraduate School. This restriction is needed because the results of the research are to be incorporated in academic processes which ensure academic multidisciplinary peer review as well as Federal review of scientific validity for use in operations.

#### **B. Cost Sharing or Matching Requirement**

No cost sharing is required under this program.

#### **C. Other**

Except for researchers who are associate, assistant, or full professors at the Naval Postgraduate School or other federally funded educational institutions, Federal Government employees are not allowed to be listed as Principal Investigators.

### **IV. Application and Submission Information**

#### **A. Address to Request Application Package**

Application packages are available at:  
<http://www.ofa.noaa.gov/%7Egrants/appkit.html>

#### **Hard copies can be available from:**

Gilbert J. Mitchell  
NOAA/NGS  
1315 East West Highway Room 9356  
Silver Spring, Maryland 20910-3282

#### **B. Content and Form of Application Submission**

Proposals must adhere to the three provisions under “Proposals” and the seven requirements under “Required Elements” by the deadline of November 17, 2003. Failure to follow these restrictions will result in proposals being returned to the submitter without review.

##### **1. Proposals**

**a.** Proposals submitted to the NOAA/NGS GSAR Program must include the original and two unbound copies of the proposal.

**b.** Investigators are not required to submit more than three copies of the proposal. Investigators are encouraged to submit sufficient proposal copies for the full review process if they wish all reviewers to receive color, unusually sized

(not 8.5x11), or otherwise unusual materials submitted as part of the proposal. Only an original version of the federally required forms and two copies are needed.

c. Proposals should be no more than 20 pages (numbered) in length, including budget, investigators vitae, and all appendices and should be limited to funding requests for 1-year duration. Appended information should be counted within the 20-page total. Federally mandated forms are not included within the page count.

## **2. Required Elements**

All proposals should include the following elements:

a. Signed title page. The title page should be signed by the PIs and the institutional representative and should clearly indicate which project area is being addressed. The PIs and institutional representative should be identified by full name, title, organization, telephone number, and address. The total amount of Federal funds being requested should be listed for each budget period.

b. Abstract: An abstract must be included and should contain an introduction of the problem, rationale, and a brief summary of work to be completed. The abstract should appear on a separate page, headed with the proposal title, institution's investigators, total proposed cost, and budget period.

c. Results from prior research. The results of related projects supported by NOAA and other agencies should be described, including their relation to the currently proposed work. Reference to each prior research award should include the title, agency, award number, PIs, period of award, and total award. The section should be a brief summary and should not exceed two pages total.

d. Project description. The proposed project must be completely described, including identification of the problem; scientific objectives; proposed methodology; operational applicability; scientific merit; proposed technology transfer; cost effectiveness of research; and the program priorities listed above. Benefits of the proposed project to the general public and the scientific community should be discussed. The project description, including references but excluding figures and other visual materials, must not exceed 7 pages of text.

e. Budget. Applicants must submit a Standard Form 424 "Application for Federal Assistance," including a detailed budget using the Standard Form 424A, "Budget Information--Non-Construction Programs." The form is included in the standard NOAA application kit. The proposal must include total and annual budgets corresponding with the descriptions provided in the project description. Additional text to justify expenses should be included as necessary.

f. Vitae. Abbreviated curriculum vitae are sought with each proposal. Reference lists should be limited to all publications in the last 3 years with up to five other relevant papers.

g. Current and pending support. For each investigator, submit a list which includes project title, supporting agency with grant number, investigator months, dollar value, and duration. Requested values should be listed for pending support.

### **C. Submission Dates and Times**

The deadline for receipt of proposals at the NOAA/NGS office is 5 p.m., EDT, November 17, 2003. Proposals received after the deadline will be returned to the sender without further consideration. NOAA/NGS determines whether an application has been submitted before the deadline by date/time stamping the applications as they are physically received in the NOAA/NGS office.

### **D. Intergovernmental Review**

Applications under this program are not subject to Executive Order 12372, "Intergovernmental Review of Federal Programs."

### **E. Funding Restrictions**

No special restrictions apply.

### **F. Other Submission Requirements**

All applicants are to submit hard copy proposals only. Facsimile transmissions and electronic mail submission of proposals will not be accepted. The hard copies may be submitted by postal mail, commercial delivery service, or hand-delivery. Proposals must be submitted to: Chief, Geodetic Services Division; NOAA/NGS; N/NGS1; 1315 East-West Highway, Room 9356; Silver Spring, Maryland 20910-3282.

## **V. Application Review Information**

### **A. Evaluation Criteria**

The evaluation criteria and weighting of the criteria are as follows:

#### **1. Importance/Relevance and Applicability of Proposal (35 percent.)**

This criterion ascertains whether there is intrinsic value in the proposed work and/or relevance to NOAA, federal, regional, state, or local activities. For the GSAR competition this includes: What is the likelihood of the proposed science activities to improve positioning, navigation, and commerce? Are proposed research activities transferrable to operations in a reasonable time frame?

## **2. Technical/Scientific Merit (30 percent).**

This criterion assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there are clear project goals and objectives. For the GSAR competition this includes: What is the intrinsic scientific value and maturity of the subject and the study proposed as they relate to the specific science priorities? Were focused scientific objectives and strategies, including data management considerations, project milestones, and time lines, used?

## **3. Overall Qualification of Applicants (20 percent).**

This criterion ascertains whether the applicant possesses the necessary education, experience, training, facilities, and administrative resources to accomplish the project. For the GSAR competition this includes: Do PIs document past scientific collaborations with geodesists? Have researchers demonstrated the ability to conduct successful research?

## **4. Project Costs (15 percent).**

This criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and time-frame. For the GSAR competition this includes: Do researchers demonstrate the ability to leverage other resources? Is there a high ratio of operationally useful results versus proposed costs?

## **5. Outreach and education (0%).**

This criterion assesses whether the project provides a focused and effective education and outreach strategy regarding NOAA's mission. The GSAR competition does not use this criterion.

## **B. Review and Selection Process**

An initial administrative review/screening is conducted to determine compliance with requirements/completeness. All proposals will be evaluated and individually ranked in accordance with the assigned weights of the above evaluation criteria by an independent peer panel review. Three NGS experts may be used in this process. The merit reviewers' ratings are used to produce

a rank order of the proposals. The Selection Official selects the proposal after considering the peer panel reviews and selection factors listed below. In making the final selection, the Selecting Official will award in rank order unless the proposal is justified to be selected out of rank order based upon one or more of the selection factors.

### **C. Selection Factors**

The Merit review ratings shall provide a rank order to the Selecting Official for final recommendation to the NOAA Grants Officer. The Selecting Official shall award in the rank order unless the proposal is justified to be selected out of rank order based upon 1, 3, and 5 of the following factors:

1. Availability of funding
2. Balance/distribution of funds
  - a. Geographically
  - b. By type of institutions
  - c. By type of partners
  - d. By research areas
  - e. By project types
3. Duplication of other projects funded or considered for funding by NOAA/federal agencies
4. Program priorities
5. Applicant's prior award performance
6. Partnerships with/Participation of targeted groups

### **D. Anticipated Announcement and Award Dates**

Subject to the availability of funds, review of proposals will occur during October 2003, and funding should begin starting November 1, 2003. November 1, 2003, should be used as the proposed start date on proposals, unless otherwise directed by the Program Officer.

## **VI. Award Administration Information**

### **A. Award Notices**

The notice of award is signed by the NOAA Grants Officer and is the authorizing document. It is provided by postal mail to the appropriate business office of the recipient organization.

NOAA/NGS will notify unsuccessful applicants, in writing, by postal mail. Those proposals that are not ultimately selected for funding will be destroyed.

## **B. Administrative and National Policy Requirements**

Administrative and national policy requirements for all Department of Commerce awards are contained in the Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements published in the Federal Register on October 1, 2001 (66 FR 49917), as amended by the Federal Register notice published on October 30, 2002 (67 FR 66109). You may obtain a copy of these by notices by contacting the agency contact(s) under Section VII, or by going to the website at: [www.access.gpo.gov/su\\_docs/aces140.html](http://www.access.gpo.gov/su_docs/aces140.html).

Applicants whose proposed projects may have an environmental impact should furnish sufficient information to assist proposal reviewers in assessing the potential environmental consequences of supporting the project.

## **C. Reporting**

Financial reports are to be submitted to the NOAA Grants Officer and Performance (technical) reports are to be submitted to the NOAA program officer. Financial and performance reports are semi-annual.

## **VII. Agency Contact(s)**

Contact Gilbert Mitchell, NOAA/NGS; 1315 East-West Highway, Room 9356; Silver Spring, Maryland 20910-3282, or by phone at 301-713-3228 ext. 114, or fax to 301-713-4176, or via internet at [Gilbert.Mitchell@noaa.gov](mailto:Gilbert.Mitchell@noaa.gov).